

## Claims

1. Apparatus for use with a sensing electrode of a human-input touch pad, the apparatus comprising:

first switching means responsive to a first control signal for selectively applying a first potential to the sensing electrode;

a sampling capacitor;

second switching means responsive to a second control signal for selectively applying a second potential to the sampling capacitor;

third switching means responsive to a third control signal for selectively parallelling the sensing electrode and the sampling capacitor; and

analog-to-digital means electrically connected with the sampling capacitor.

2. The apparatus of claim 1 wherein the first and third switching means are a single-pole double-throw switch, the third control signal comprising an inversion of the first control signal.

3. The apparatus of claim 1 wherein the first potential is ground.

4. The apparatus of claim 1 wherein the second potential is a positive voltage.

5. A method for use with a sensing electrode of a human-input touch pad and with a sampling capacitor, the method comprising the steps of:

applying a first potential to the sensing electrode;

applying a second potential to the sampling capacitor;  
parallelizing the sensing electrode and the sampling capacitor; and  
measuring a potential at the sampling capacitor.

5. The method of claim 5 wherein the first applying step and the paralleling step are  
accomplished by operating a single-pole double-throw switch.

6. The method of claim 5 wherein the first potential is ground.

8. The method of claim 5 wherein the second potential is a positive voltage.

9. Apparatus for use with a sensing electrode of a human-input touch pad, the apparatus  
comprising:

a first sampling capacitor having first and second leads connected at its first lead by a first  
switch to the sensing electrode;

a second sampling capacitor having first and second leads connected by its first lead to the  
first sampling capacitor and by the first switch to the sensing electrode;

first switching means responsive to a first control signal for selectively applying a first  
potential to the sensing electrode;

second switching means responsive to a second control signal for selectively applying a  
second potential to the first sampling capacitor at its second lead;

third switching means responsive to a third control signal for selectively applying a third  
potential to the second sampling capacitor at its second lead;

analog-to-digital means electrically connected with the second lead of the second sampling capacitor.

10. A method for use with a sensing electrode of a human-input touch pad and with first and second sampling capacitors each having a first and second lead, the apparatus comprising:

selectively applying a first potential to the sensing electrode;

selectively applying a second potential to the first sampling capacitor at its second lead while its first lead is electrically connected to the sensing electrode;

selectively applying a third potential to the second sampling capacitor at its second lead while its first lead is electrically connected to the sensing electrode;

with the first leads of the first and second sampling capacitors electrically connected, selectively applying a fourth potential to the second sampling capacitor at its second lead, and measuring a potential at the second lead of the first capacitor.

11. Apparatus for use with a sensing electrode of a human-input touch pad, the apparatus comprising:

a sampling capacitor having first and second leads,

first switching means responsive to a first control signal for connecting the first lead of the sampling capacitor with the sensing electrode and connecting the second lead of the sampling capacitor to a first potential;

the first switching means responsive to a second control signal for connecting the first lead of the sampling capacitor to a second potential and connecting the second lead of the sampling capacitor with the sensing electrode; and

analog-to-digital means coupled with the sensing capacitor for measuring a potential thereof.

12. A method for use with a sensing electrode of a human-input touch pad and with a sensing capacitor, the method comprising the steps of:

connecting the first lead of the sampling capacitor with the sensing electrode and connecting the second lead of the sampling capacitor to a first potential;

connecting the first lead of the sampling capacitor to a second potential and connecting the second lead of the sampling capacitor with the sensing electrode; and

measuring a potential at the sampling capacitor.

13. Apparatus for use with a first number of sensing electrodes of a human-input touch pad, the apparatus comprising:

a sampling capacitor having first and second leads;

potential measurement means electrically connected with the sampling capacitor;

a multiplexer;

the multiplexer comprising:

a first switching stage comprising switches fewer in number than the first number, and comprising more than one switch, the switches having first ends electrically connected with the first lead of the sampling capacitor;

a second switching stage comprising groups of switches, each group corresponding to a respective second end of a switch in the first stage, each group comprising more than one switch, the switches in each group having first ends electrically connected with the respective

second end;

a third switching stage comprising groups of switches, each group corresponding to a respective second end of a switch in the second switching stage, each group comprising more than one switch, the switches in each group having first ends electrically connected with the respective second end;

each switch in the third switching stage having a second end electrically connected with one of the sensing electrodes.